A Revision of the Genus *Entomobrya*, Rond. (*Degeeria*, Nic.).

By GEORGE BROOK, F.L.S.

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(PLATES X. & XI.)

M. BOURLET, in his paper before the Royal Society of Lille, in 1839, divided the *Poduræ* into five genera—two with scales and three without. Of the latter the genus *Isotoma* was characterized as follows:—" Corps non garni d'écailles, plus ou moins velu; antennes courtes, de quatre articles, à peu près égaux" (p. 399). It may be here remarked that, from the above description, it is clear that Bourlet's name of *Isotoma* had reference to the segments of the antennæ being equal; and this is borne out by the fact that Bourlet regarded the form and number of segments of the antennæ of the *Poduræ* as forming good generic characters. At the present time, however, unless one had access to Bourlet's papers, one would expect the name *Isotoma* to refer to the four subequal abdominal segments, as the form of the antennæ is no longer characteristic.

In 1842 Nicolet published a paper (Roy. Soc. Helv.), in which he divided the species included in Bourlet's *Isotoma* into two genera:—

Desoria, in which the first four abdominal segments are subequal.

Degeeria, in which the fourth abdominal segment is at least as long as the three preceding taken together.

The name *Desoria* has had to give way to the older one of *Isotoma*, and hitherto *Degeeria* has stood as a good genus. The name, however, is unfortunate, as it was already occupied for another genus of insects. Meigen in 1838 (Syst. Beschr. eur. Zweifl.) gave the name *Degeeria* to a parasitic genus of Diptera, which now forms a large and important genus of the order. Curiously enough, Nicolet's genus is the only one mentioned in Agassiz's 'Nomenclator.' If the two genera were very wide apart so that there could be no risk of confounding them, perhaps it would do no harm to retain Nicolet's name. Rondani (Dipterolog. Ital. Prodr. vol. iv.), seeing this difficulty, suggested the name *Entomobrya* instead of Nicolet's *Degeeria*; and although the name is not a very suitable one, it will be better to accept this than confuse matters more by adding another to the list. Mr. Meade, in a note in the 'Entomologist's Monthly Mag.' vol. 18, also points this out; and Mr. M^{c}Lachlan calls attention to the desirability of adopting Rondani's name. It is, however, particularly unfortunate that the name *Degeeria* has to be changed, as the genus is well established and has lent its name to a division of which it is the type.

The species of this genus are very widely distributed and very variable. Hitherto a considerable importance has been attached to the size, position, and colour of the various markings, so that it is only natural to expect a good many synonyms. In the first place, Lubbock (Linn. Soc. Trans. 1869) separated those species described by Nicolet as being clothed with scales, and founded a new genus for them under the name of *Sira,* on account of their linking together the genera *Entomobrya* and *Lepidocyrtus.* Of the species without scales Lubbock, in his Ray Soc. Monograph, has condensed the number to sixteen species, as follows:—

1. *E. nivalis,* L. (Nic. & Lubk.).
2. *E. annulata,* Fabr.
3. *E. albocincta,* Temp.
4. *E. lanuginosa,* Nic.
5. *E. Nicoletii,* Lubk.
6. *E. cincta,* Lubk.
7. *E. disjuncta,* Nic.
8. *E. corticalis,* Nic.
9. *E. muscorum,* Nic.
10. *E. fenestrarum,* Bourl.
11. *E. variegata,* Guér. & Per.
12. *E. membranea,* Nic. (Chili).
13. *E. incerta,* Nic. (Chili).
14. *E. decora,* Nic. (Chili).
15. *E. atra,* Nic. (Chili).
16. *E. fasciata,* Say.

In 1871, Tullberg (Fört. öfver Sv. Pod.) added two species to the list, viz.:—

E. arborea, Tullb.
E. marginata, Tullb.

and in 1873 Packard (Thys. of Essex Co., Mass.) added four more species to the American list, viz.:—

E. perpulchra, Pack.
E. griseo-olivata, Pack.
E. purpurascens, Pack.
E. decemfasciata, Pack. (*D. flavopicta,* Pack., Study Ins. 3rd ed.; *D. flavocincta* of later editions).

In 1876 Reuter described a species which he queried *Degeeria*? *superba* (Cat. Pod. Fenniæ). Finally, Mr. H. N. Ridley described, in the Ent. Mo. Mag. 1881, another species under the name of *D. pulchella.* This makes now a total of twenty-four species hitherto described, which I now propose to reduce to eleven, for reasons which will be discussed under each species.

The first attempt at condensing the number of species of this order was made by Lubbock (Ray Society Monogr.) when he showed that *Orchesella cincta*, L., was of such a variable nature in its markings as to present almost every phase between a specimen without markings and one nearly black.

The object of the present paper is to show that in the genus *Entomobrya* also we have a common widely distributed species which, at different ages and under different conditions, presents a similar series of gradations from the light to the dark which have been proved to occur in *Orchesella cincta*, L. By the aid of photography I have been enabled to arrive at this conclusion with the more certainty, because I am always assured of the accurate mapping out of the markings, where drawing to be as accurate would be an extremely difficult task. Again, the camera has assisted me in the identification of certain markings which, when seen under the microscope and by gas-light, did not appear at all.

ENTOMOBRYA, *Rondani*.

1839. Isotoma, *Bourl.* (in partem).
1842. Degeeria, *Nic.* (in partem).

Mesonotum not prominent; fourth abdominal segment at least as long as the three preceding taken together. Eyes eight in each group. Antennæ shorter than the body, consisting of four segments and a minute basal ring; the three terminal ones subequal. Feet biunguiculate, each claw with a tenent hair. Upper claw usually with two teeth—one, well marked, about the middle of the inner margin, and the other smaller or sometimes absent. There is sometimes a small tooth on the outer margin. The number of the teeth seems to vary considerably in the same species, so that this character is of no specific value. Saltatory appendage long.

Body covered with long hairs which are clubbed on the anterior part of the body, and long and geniculate on the posterior part. Besides these there is a thick downy covering of fine short hair all over the body.

1. ENTOMOBRYA NIVALIS, *L.*

1740. "Små grå insekter," &c., *De Geer, Vet.-Akad. Hand.* vol. i. p. 276.
1758. Podura nivalis, *L. Syst. Nat.* ed. x. t. i. p. 609.
1835. P. nigromaculata, *Temp. Thy. Hibern.* p. 94.
1838. P. minuta, *Burm. Handb. d. Ent.* B. ii. p. 449.
P. nivalis, *Burm. ibid.* p. 450.
1858. Degeeria pi, *Herklots, Tijds. v. Entom.* vol. i. p. 94.
1862. D. nigromaculata, *Lubk. Notes Thy.* pt. ii. p. 593.

1871. D. nivalis, *Tull. Œfver Sv. Pod.* p. 148.
1873. D. annulata, (*Fabr. of*) *Lubk. Ray Soc. Monogr.* p. 109.

Ground-colour usually greenish yellow, with the markings very distinct. Antennæ a little more than half the length of the body; terminal three segments subequal. Second thoracic ring large, with a faint basal band; third thoracic half the length of the second, marked as in the preceding but a little darker. First abdominal ring very narrow, almost without band; second and third abdominals increasing in width, with broad bands somewhat triangular at the extremities; fourth abdominal a little longer than the four preceding segments taken together, with two triangular bands with their apices reaching the base of the segment, their bases never uniting, the whole segment tapering considerably towards the base; fifth and sixth abdominals with marginal bands.

This species is not very variable; the markings on the fourth abdominal segment, by which this species can be recognized at a glance, are usually well defined and clear in outline; if any bands are absent, those on the thorax disappear first. I have not seen any specimen, however, without markings altogether on the first and second abdominal segments. Length $\frac{1}{10}$ inch.

Found throughout the year under logs of wood, &c. I have also found it on ling, grass, elder, furze, willow, birch, alder, pine, and lichen. In some specimens of this species there are four sheaths around the mucros, instead of two as is usually the case.

I agree with Tullberg that Nicolet and Lubbock have not correctly identified the *P. nivalis* of L. Linnæus always refers to the figure of De Geer for this species, and there can be no doubt as to its identity on a comparison of the figures. Nicolet's species is nevertheless a good one; and here in England is much the commonest of the genus. Since the time of Nicolet his species *nivalis* has been regarded as identical with that of Linnæus, with, as far as I am aware, no exception until the publication of Tullberg's 'Sveriges Podurider.' It is true that Herklots (Tijds. v. Entom. 1858) assured himself that two distinct species were confounded under the one name. He suggested that the species described by De Geer as "*Podura campestris cinerea*" (Act. Ups. 1840) and as "*Podura arborea grisea*" (Mém. sur les Insectes, vii.) should be known as *Degeeria pi*. I think, however, that when Linnæus and De Geer agreed that the former's *nivalis* was the same species as that of the latter, it is Nicolet's name which should be changed. I have therefore added *D. pi*, Herkl., to the list of synonyms of this species, and accepted Tullberg's name *multifasciata* for that of Nicolet.

Hab. Britain, Finland, Sweden, France, and Italy.

2. Entomobrya intermedia, n. sp.

Antennæ very long and slender as compared with the other species of this genus; yellow at the base and gradually shading off to violet. Some of the darker specimens have a black ring at the apex of the first segment. Head with an anterior black band extending across the base of the antennæ, and continued along the lateral margins; an anchor-shaped patch in the centre. Second thoracic segment about a third longer than the third segment. First abdominal segment about half the length of the second, with only a faint line on the posterior margin and two or three light lateral patches; second abdominal with dark lateral markings, and four small patches in the centre of the dorsal aspect; third abdominal segment with dark lateral markings, and a triangular patch pointing downwards from the centre of the anterior margin; fourth abdominal segment rather longer than the three abdominal and the third thoracic segments taken together, only slightly tapering to the base; there is a central large triangular patch uniting the two very bold lateral longitudinal bands; there is also a dark spot in the centre of the posterior margin; fifth and sixth abdominal segments small, with a dark lateral band. General body-colour yellow, with brown to almost black markings. Body slightly widening to the third abdominal segment, and rather wider at the posterior end of the fourth than at the mesothorax. Spring reaching beyond the ventral tube; dentes and manubrium subequal. Upper claw with a distinct tooth about the centre of the inner margin, and a fainter one halfway between that and the tip. Lower claw lanceolate, half the length of the other. Length $\frac{1}{9}$–$\frac{1}{10}$ inch, width $\frac{1}{32}$–$\frac{1}{50}$ inch. Length of antennæ $\frac{1}{13}$–$\frac{1}{16}$ inch.

The young of this species is interesting as showing the development of the markings of the adult. The terminal segment of the antennæ is much longer than any of the others; but this is usually the case with young specimens. The markings are not yet complete; there is no triangular patch on the central posterior margin of the third abdominal segment, but the central spot on the base of the fourth and two lateral ones on the fifth are already present. There is as yet no triangular patch connecting the two lateral bands on the fourth abdominal segment, though the photograph shows indications of one. This is owing no doubt to the actinic effect of the darker yellow of the skin prior to the formation of distinct markings. The fourth abdominal segment is longer than the three preceding and the metathorax taken together. The upper claw appears untoothed; the lower one nearly as long as the upper in the third pair of legs, not so long in the others. Tenent hair not much dilated.

This species comes nearest to *E. nivalis*, both in shape and in markings. In shape it differs in having the antennæ longer and not so dilated; the fourth abdominal segment longer and not so tapering, so that altogether the animal is less fusiform than in *E. nivalis*. In markings the chief differences are the triangular patch uniting the two lateral bands on the fourth abdominal segment and the central basal spot on the same, both of which seem very constant in this species, and which I have never observed in any other *Entomobrya*.

This species has been sent to me by Mr. J. Sinel, of Jersey, who has gathered it several times from May to August 1882 on the surface of stagnant pools. Hitherto I am not aware of its being found in England. I have, however, a mounted specimen sent me by Miss Garrod, and labelled " Kahlenberg Woods, near Vienna, August 1882," which is probably a pale variety of this species. The shape, particularly in the antennæ, is that of *E. intermedia*; but the markings are more like Lubbock's *E. Nicoletii*, with these additions, that there is a faint lateral band running the length of the thorax and first three abdominal segments, a pale streak on each side of the fourth abdominal segment and a central dark line at the base; there is a prominent central black band on the fifth abdominal segment. I have also had the opportunity of examining another specimen, which convinces me that this is at any rate a distinct variety, and I have named it provisionally var. *elongata*.

Hab. Channel Islands; Austria (var. *elongata*).

3. ENTOMOBRYA MULTIFASCIATA, *Tullb.*

1821. Podura fasciata, *Say*? (*Journ. Acad. Phil.* vol. ii. p. 12).
1838. P. variegata, *Guér. & Per. Gén. des Ins.*
1840. P. simplex, *Koch, Fauna Ratisbonensis, Herrich-Schäffer's*, iii. p. 354.
P. striata, *Koch, ibid.* p. 354.
1841. Degeeria nivalis, *Nic. Mém. Soc. Helv.* p. 70.

1841. D. lanuginosa, *Nic. ibid.* p. 74.
D. disjuncta, *Nic. ibid.* p. 71.
D. corticalis, *Nic. ibid.* p. 72.
1862. D. nivalis, *Lubk. Notes on Thys.* pt. ii. p. 594.
1867. D. Nicoletii, *Lubk. Linn. Soc. Trans.* p. 299.
1871. D. muscorum, (*Nic. of*) *Tullb. Fört. öfver Sv. Pod.* p. 148.
D. multifasciata, *Tullb. ibid.* p. 148.
D. arborea, *Tullb. ibid.* p. 148.
D. marginata, *Tullb. ibid.* p. 148.
1873. D. decemfasciata, *Pack.* ? *Thys. Essex Co., Mass.* p. 40.
1881. D. pulchella, *Ridley, Ent. Mo. Mag.* vol. xvii. p. 270.

Type.—Antennæ about half the length of the body; the three terminal segments usually subequal, but the second may be either a little longer or a little shorter than the other two. Colour yellow, shading off to violet in the lighter specimens, to brown in the darker ones; there is sometimes a brown ring at the tip of the first segment.

Head yellow, with a broad dark band around the margin as seen from above crossing the eye-patches. The anchor-shaped band on the crown of the head is usually well defined.

Mesothorax slightly longer than metathorax, with a dark band on its anterior margin which runs along the epimera as far as the fourth abdominal segment; there is also a strong central basal band not reaching the margin; there is a similar basal band on the metathorax.

The first three abdominal segments increasing in length, with similar dark basal bands on each; that on the first shows a little thickening at the extremities; those on the second and third have this thickening increased to a triangular patch. Fourth abdominal segment not so long as the first three and the metathorax taken together, fusiform, with two interrupted bands—one across the centre and one across the basal portion of the segment, sometimes the two bands unite by triangular patches on each side of the median line: this segment is narrower at the base than the mesothorax. Fifth and sixth abdominal segments small, with strong basal bands.

Spring not passing the ventral tube. Claws strong; the upper one with a tooth about the centre of the inner margin, but there is often another smaller one, and sometimes a very small one on the outer margin. Lower claw lanceolate. Lateral plates lanceolate and a little curved; sometimes the tip of one of these plates is in such a position as to be easily mistaken for a strong tooth on the upper claw. Length $\frac{1}{15}$ inch, width $\frac{1}{50}$–$\frac{1}{60}$ inch.

ENTOMOBRYA MULTIFASCIATA, var. PULCHELLA, *Ridley*.

The basal two segments of the antennæ yellow ringed with brown, the terminal two dirty violet. Head dark anteriorly, but behind the anchor-band there are no markings. Mesothorax with a broad dark band anteriorly, proceeding backwards along the epimera as in the type. No basal band on this segment. Metathorax dark brown, excepting two or three small spots of yellow on each side. First abdominal segment without coloured band. Second abdominal with a strong dark band along the basal margin, and the same colour occupying nearly the whole of the segment. Third as second, but perhaps a little more yellow showing through towards the anterior margin. Fourth abdominal segment has the basal two thirds occupied with the dark brown colour, excepting an irregular triangular pale patch just above the basal line, and another at each side; the basal margin itself is very dark. Fifth and sixth abdominal segments almost entirely dark brown. Legs pale, with dark patches on the femora. Spring pale.

This variety was found by Mr. H. N. Ridley under the dead bark of an elm at Cumnor, Berkshire, in March 1879, and was described by him as a new species in the 'Entomologist's Monthly Magazine' for May 1881. Mr. Ridley has kindly forwarded me a specimen of this species, which I have examined carefully and compared with many other specimens. In some respects the specimen I have differs from Mr. Ridley's description, and, again, from a sketch which he also sent me. I cannot say that I have a specimen exactly like the one supplied, but then it would be difficult to find two insects exactly alike. The chief characteristics of this variety are the absence of markings on the basal part of the mesothorax, and also on the first abdominal segment, coupled with the greater proportion of colour on other parts of the body. I have specimens without a basal band on the mesothorax and also without any markings on the first abdominal segment; in fact, I find that if you compare a series of specimens these two bands are the first to disappear. Again, I have specimens in which nearly all the other segments are marked as in *pulchella*; so that I think I am justified in regarding this as a dark variety of *multifasciata*, more particularly as I have observed almost every gradation of change from this to var. *lanuginosa*, in which there are no markings at all.

ENTOMOBRYA MULTIFASCIATA, var. NICOLETII, *Lubk.*

Terminal two segments of the antennæ violet. There is a dot between the antennæ, two spots of colour on each side of the centre of the basal margin of the fourth abdominal segment, and a dark basal line on the fifth. There are no markings elsewhere, and the general body-colour is yellow. There are, however, no strangulations in the antennæ and between the manubrium and dentes as figured by Lubbock; but I have not observed these in any species of *Entomobrya.* Tullberg included this as a variety of his *muscorum*; but I regard *muscorum*, Tullb., and *multifasciata*, Tullb., as varieties of the same species, and the variety *muscorum* comes intermediate between the type and Lubbock's *Nicoletii*; but as I do not think it a constant form, I have not ranked it here as a variety. I am now speaking of Tullberg's *muscorum*; the variety described under that name by Nicolet is much more likely to be a young *Orchesella.* I have a specimen of *O. cincta* in my collection almost identical with Nicolet's figure.

I have one gathering of over 100 specimens, all collected from a stunted elm in St. Clement's Bay, Jersey, in which there is not only the typical *multifasciata*, *Nicoletii*, and *lanuginosa*, but many intermediate forms, so that I think there is little doubt of these being varieties of the same species. I have photographed a good many specimens, some of which are used to illustrate this paper, descriptions of which will be found at the end.

ENTOMOBRYA MULTIFASCIATA, var. LANUGINOSA, *Nic.*

This variety has no markings, and is usually rather more hairy than the other varieties. The first mark that appears is one between the antennæ; then those at the base of the fourth and fifth abdominal segments, as in typical *Nicoletii.* After this the markings on the fourth abdominal segment spread a little, the line along the epimera begins to show itself; next a double row of dots along the segments from the metathorax to the third abdominal segment; and a third development of these brings us to the typical *multifasciata.* In fact, unless all these forms are regarded as one species, one might raise almost every half dozen specimens to the rank of a species. Doubtless the nature of the environment has something to do with the development of colour in this species; for instance, I have usually found specimens from the low herbage on sandhills to be pale yellow and almost all without markings, and those from the trunks of trees usually are of the darker varieties. I cannot say, however, how far this hold good. Doubtless age has also something to do with it, as young specimens have usually fewer markings than old ones. On the other hand, I have quite young specimens with indications of all the typical markings of *multifasciata*, and others of the *lanuginosa* and *Nicoletii* varieties that are full-grown.

Hab. (*E. multifasciata* and vars.). Britain, including Channel Islands, Siberia, Finland, Sweden, Switzerland, France, Italy, and North America.

4. ENTOMOBRYA ALBOCINCTA, *Temp.*

1835. Podura albocincta, *Temp. Trans. Ent. Soc.* vol. i. p. 95.
1862. Degeeria cincta, *Lubk. Linn. Soc. Trans.* p. 594.

This species is very much of the form of *E. multifasciata*, though rather smaller. The antennæ are about half the length of the body; the first segment is dark yellow, with a black ring at the apex; the second is a dark dirty violet in the apical half, and the other two are the same colour. The head is brown anteriorly, shading off to yellow. The mesothorax has a dark band in front; the ground-colour is yellow, which gets very pale towards the posterior extremity. The metathorax and the first three abdominal segments are black; the fourth has the basal two thirds black and the upper third dark yellow. The fifth and sixth abdominal segments are yellow. Length $\frac{1}{15}$ inch.

I regard Templeton's species as a young form of that described later by Lubbock, because some specimens I found under tiles as described by Templeton, and which answered fairly to his description, assumed when kept in confinement the *cincta* form of Lubbock. Templeton's name should therefore be the one used to designate this species.

Hab. Britain (originally described from Ireland) and Channel Islands; but hitherto not recorded elsewhere, although very common in England.

5. ENTOMOBRYA? SUPERBA, *Reuter.*

1876. Degeeria? superba, *Reuter, Med. Soc. pro Fauna et Flora Fennica*, i. p. 85.

Reuter's description is as follows:—

"Flava, capite, ore excepto, mesonoto disco dimidio basali lateribusque fere totis, metanoto segmentisque que abdominis secundo et tertio fascia basali lata et in lateribus dilatata, nec non segmento abdominis quarto nigris, hoc quarto parte basali margineque apicali flavis, segmento quinto fascia transversali, furcula anali basi lineis duabus longitudinalibus, femoribus posticis annulis duabus, altera media, altera subapicali, antennisque corpori fere longitudine æqualibus annulo subapicali articuli secundi annulisque basali et apicali articulorum tertii et quarti nigris, articulo quarto duobus penultimis longitudine subæquali, obscurius rufescenti-testaceo. Long. $2\frac{1}{3}$–$2\frac{1}{2}$ mm.—Species pulcherrima et distinctissima verisimiliter ad gen. *Degeeria* referenda. Forsitan generis *Siræ* species, sed in hoc casu squamis saltim in speciminibus descriptis detritis." *Hab.* Finland.

I am unable to express any opinion on this species.

The following four species have been described by Nicolet from Chili:—

6. Entomobrya membranea, *Nic.*

1849. Degeeria membranea, *Nic., Gay's Hist. Chile.*

"*D.* elongata, pallida; antennis crassis, longitudine corporis; abdominis segmento quarto duplo longiore primis tribus conjunctim. Affinissima præcedenti." He adds:—"Body not very hairy, entirely of a dirty white, yellowish and shining, like old parchment. Long. 1 line." *Hab.* Chili.

This species is probably a *Sira*, as the "preceding species" to which he refers (*D. crassicornis*) is a scaled species.

7. Entomobrya incerta, *Nic.*

1849. Degeeria incerta, *Nic., Gay's Hist. Chile.*

"*D.* elongata, villosa, fusco nigroque variegata; pedibus furcaque flavescente nigro maculatis." He adds:—"Body of a dark yellowish fuscous, irregularly spotted with black; legs and spring yellow, with several black spots. Antennæ yellow, ringed with black at the articulations. Long. 2 lines."

This species differs from the others of the genus by having the fifth and sixth segments about equal in length, and the spring short, approaching that of *Isotoma*. *Hab.* Chili.

8. Entomobrya decora, *Nic.*

1849. Degeeria decora, *Nic., Gay's Hist. Chile.*

"*D.* oblonga, depressa, flava, corpore nigro maculato, antennis primis articulis luteis, ultimo nigro; pedibus furcaque flavescentibus." The anterior margin of the head and the eyes are black; the first segment of the thorax is of a paler yellow than the rest of the body, margined with black. The abdomen has a median longitudinal band composed of four transverse, quadrate, black spots united with each other; along the sides another row of irregular spots placed obliquely. Length ½–1 line. *Hab.* Chili.

9. ENTOMOBRYA ATRA, *Nic.*

1849. Degeeria atra, *Nic., Gay's Hist. Chile.*

"*D.* oblonga, depressa, nigra; pedibus furcaque pallide testaceis." Shining and uniform black, pale beneath; antennæ fuscous. Long. ½ line. *Hab.* Chili.

The following three species have been described by Packard from the United States:—

10. ENTOMOBRYA PERPULCHRA, *Pack.*

1873. Degeeria perpulchra, *Pack. Thys. Essex Co., Mass.* p. 38.

"An exceedingly beautiful species, smaller than usual. Body rather ovate in form; third abdominal segment rather long. Antennæ rather short and thick and more hairy than usual; third joint rather shorter than the fourth, the latter joint more ovate and pointed than usual. Clavate hairs on the head and thorax; end of the body and elater quite hairy. Antennæ purplish, concolorous with the head and thorax. A broad conspicuous band runs along the side of the head, including the eyes; a similar line on front and side of thorax. A much broader, conspicuous, black dorsal band on third thoracic (the first or prothoracic not seen from above) segment. The abdomen and basal half of the elater honey-yellow; end of the elater whitish; lower edge of second joint rather coarsely serrulate, the joint dilated where the teeth end, beyond simple, flexed as usual; this portion not so long and slender as in many species; the terminal hairs do not reach to the end of the third joint; this latter joint much as usual, with a stout long terminal tooth and a slender long inner tooth. Legs whitish. Claws very slender, smaller one scarcely more than half as long as the larger, a single large tenent hair unusually swollen at the extremity. Length ·04–·05 in." *Hab.* North America.

11. ENTOMOBRYA GRISEO-OLIVATA, *Pack.*

1873. Degeeria griseo-olivata, *Pack. Thys. Essex Co., Mass.* p. 39.

"Pale olive-green, with dark purplish leaden antennæ, the legs much paler, purplish; elater whitish. Body above hairy, especially on the thoracic segments. Eye-patches black, connected by a slender black line in front. A blackish line (sometimes wanting) along the lower edge of the segments and hinder edge of the last abdominal segment. Antennæ rather stout, moderately long. Posterior end of body with rather stout clavate hairs, with a few long bowed hairs scattered among them. Elater with several long hairs at the end, one longer and larger than the other and reaching a little beyond the end of the third joint; the second joint is serrulate along lower edge, it suddenly narrows a little below the end and is a little curved; third joint about three times as long as wide, ending in a large hook, with a much smaller supplementary tooth. Long ·05–·06 in."

Under bark of trees. *Hab.* North America.

12. ENTOMOBRYA PURPURASCENS, *Pack.*

1873. Degeeria purpurascens, *Pack. Thys. Essex Co., Mass.* p. 39; *Guide to Study of Insects,* pl. 10. f. 4 & 5.

"Eyes black, with no connecting-lines. This is rather a large species, with unusually long slender antennæ; with the body, legs, and antennæ of a purplish lead-colour, the purplish tint especially noticeable on the two basal joints of the antennæ. Not very hairy; the hairs on the prothorax and head of quite uniform length, club-shaped, those on the posterior end of the body very slender, no bowed ones amongst them (though my specimens are somewhat rubbed). Legs slender, claws long and slender, larger claw with two acute prominent teeth along the inner edge. Elater with long dense hairs along upper side of second joint; serrulate, the teeth suddenly ending, leaving the end narrow, slender, naked, slightly bent, with a long hair projecting beyond the tip of third joint; this joint rather short, much curved on the outer side, ending in a rather slender hook, with an inner one of nearly the same size. 'Catch' large; basal joint longer than broad, with a stout bristle arising from middle of anterior edge and reaching nearly to tip of second joint, both front and hind edge with three or four notches; second joint very slender on the toothed portion, four-toothed, whole joint one half as long as first joint. Length ·08–·09 in. Under boards and bark of trees." *Hab.* North America.

This description is taken from the 'Thysanura of Essex County, Mass.'

Packard also describes another species, *D. decemfasciata*, in the above list. This species is figured in 'Study of Insects,' 3rd ed. pl. 10. f. 2, 3, under the name *D. flavopicta* (changed to *flavocincta* in the latest editions). I have considered it so near to our *multifasciata* that I have included both names as synonyms. Packard also remarks that his species is very variable.

DESCRIPTION OF THE PLATES.

PLATE X.

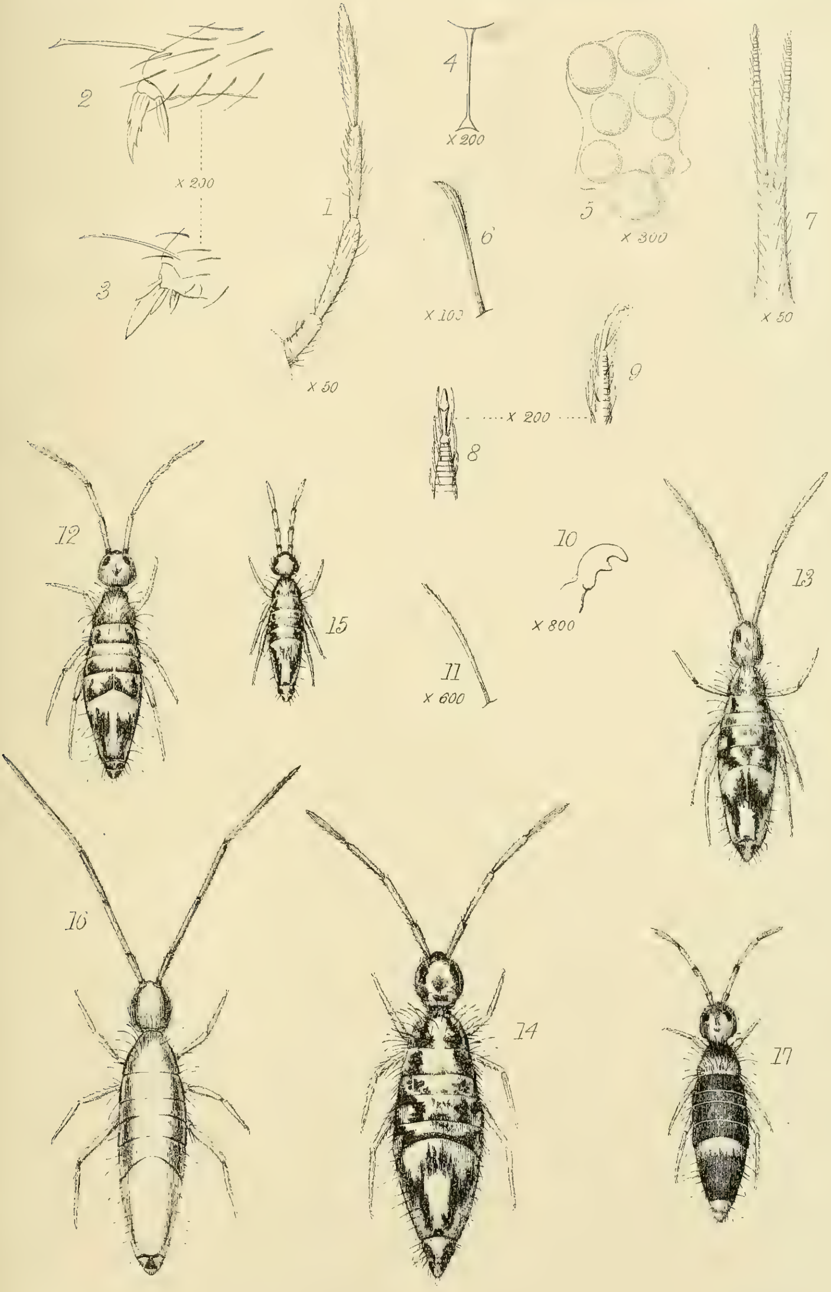
Fig. 1. Typical antennæ of *Entomobrya*, × 50.

2. Claw (side view), ×200.
3. Claw (semi-dorsal view), ×200, showing lateral plates.
4. Tenent hair, seen from above.
5. Left eye-patch, ×300.
6. Clubbed hair from thorax, ×100.
7. Spring, ×50.
8. *Mucro*, under view, } ×200. *a*, Setæ on the sides of the *dentes*.
9. The same, side view, }
10. The same, apex, ×800.
11. Seta from *mucro*, ×600.
12. *E. nivalis*, L., ×16.
13. *E. intermedia*, n. sp., ×16.
14. The same, ×16. This specimen has been flattened a little by the cover-glass pressing a little on it, so that the body looks wider and more fusiform than it really is.
15. *E. intermedia*, ×16. Young specimen. The central patch uniting the two lateral bands on the fourth abdominal segment only appears of a little darker yellow colour in the specimen, but this in photography takes dark. It evidently shows that the band is in process of formation.
16. *E. intermedia*, var. *elongata*, ×16.
17. *E. albocincta*, Temp., ×16.

PLATE XI.

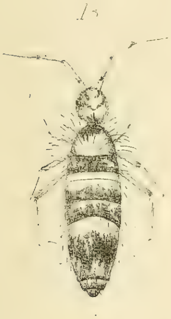
Fig. 18. *Entomobrya multifasciata*, Tullb., var. *pulchella*, Rid., ×16.

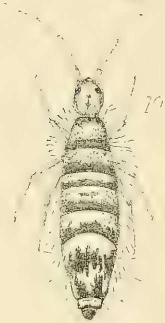
19. *E. multifasciata*, Tullb. (dark form), ×16.
20. The same (type), ×16.
21. The same (pale form), × 16.
22. The same, approaching var. *Nicoletii*, Lubk., ×16. No central dorsal markings. A line in front of the head, and another along the epimera, besides the marks on the third and fourth abdominal segments.
23. The same, var. *Nicoletii* nearly, Lubk., ×16. The upper part of the bands on the fourth abdominal segment (*a*) only appears in the object itself as darker yellow than the surrounding colour, and thus, by photography, come out as bands. This is very interesting, as showing the transitional stage in which this specimen is. This is evidently a young form.
24. The same, var. *Nicoletii*, Lubk., ×16.
25. The same, var. *lanuginosa*, Nic., ×16. Although this specimen has no markings, the dark body-colour on the fifth and sixth abdominal segments (*a*) and the base of the fourth comes out by photography as darker bands, showing an approach to var. *Nicoletii*, Lubk.
26. The same, var. *lanuginosa*, Nic., ×16. This is a typical specimen.

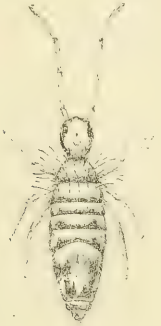


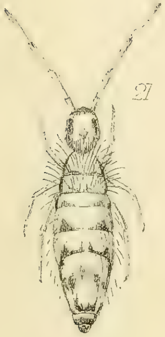
Jarman sc.
Hanhart imp.

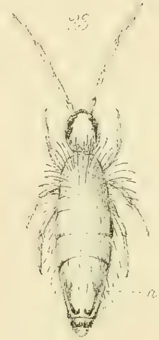
SPECIES OF ENTOMOBRYA & DETAILS.

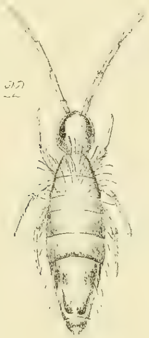


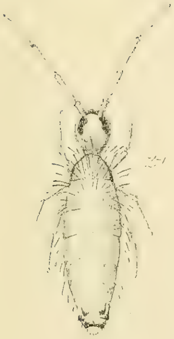


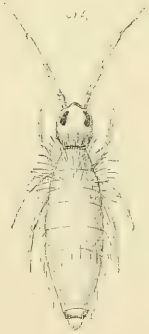


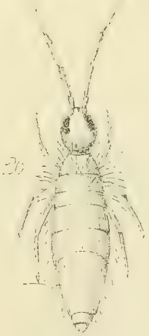












Jarman sc.

Hanhart imp.

SPECIES OF ENTOMOBRYA & DETAILS.